IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

    HIDEOMI IDEI *et al.*

Application No.: 10/656,096

Filed: September 5, 2003

For: MANAGEMENT SERVER FOR ASSIGNING STORAGE AREAS TO SERVER, STORAGE APPARATUS SYSTEM AND PROGRAM

Customer No.: 20350

Examiner: Unassigned

Technology Center/Art Unit: 2141

Confirmation No.: 9922

RENEWED PETITION TO MAKE SPECIAL FOR NEW APPLICATION UNDER M.P.E.P. § 708.02, VIII & 37 C.F.R. § 1.102(d)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Decision dated December 16, 2005 dismissing the original petition to make special, Applicants respectfully submit a renewed petition to make special the above-identified application under MPEP § 708.02, VIII & 37 C.F.R. § 1.102(d). The application has not received any examination by an Examiner.

(a)   The Commissioner is authorized to charge the petition fee of $130 under 37 C.F.R. § 1.17(i) and any other fees associated with this paper to Deposit Account 20-1430.

(b)   All the claims are believed to be directed to a single invention. If the Office determines that all the claims presented are not obviously directed to a single invention, then Applicants will make an election without traverse as a prerequisite to the grant of special status.

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(c)   Pre-examination searches were made of U.S. issued patents, including a classification search and a key word search. The classification search was conducted on or around November 5, 2004 covering Class 709 (subclasses 201, 203, 213, and 214) and Class 711 (subclasses 148 and 170), by a professional search firm, Lacasse & Associates, LLC. The key word search was performed on the USPTO full-text database including published U.S. patent applications. The inventors further provided two references considered most closely related to the subject matter of the present application (see references #8-9 below), which were cited in the Information Disclosure Statements filed on September 5, 2003.

(d)   The following references, copies of which were previously submitted, are deemed most closely related to the subject matter encompassed by the claims:

(1)   U.S. Patent No. 6,606,690 B2;

(2)   U.S. Patent Publication No. 2002/0078174 A1;

(3)   U.S. Patent Publication No. 2002/0156984 A1;

(4)   U.S. Patent Publication No. 2003/0110263 A1;

(5)   U.S. Patent Publication No. 2003/0236884 A1;

(6)   U.S. Patent Publication No. 2004/0193827 A1;

(7)   U.S. Patent Publication No. 2004/0194061 A1;

(8)   Japanese Patent Publication No. JP 10-333950; and

(9)   Evaluator Group, Inc., "Virtualization of Disk Storage," The Evaluator Series, WP-0007-1, September 2000, at pp. ii, 1-12.

(e)   Set forth below is a detailed discussion of references which points out with particularity how the claimed subject matter is distinguishable over the references.

A.   Claimed Embodiments of the Present Invention

The claimed embodiments relate to a system including a management server which manages storage areas of storage apparatuses as virtual storage areas.

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Independent claim 1 recites a management server connected to a plurality of servers to manage storage areas included in storage apparatuses as virtual storage areas. The storage apparatuses are shared by the plurality of servers. The storage apparatuses include assignment areas which are storage areas assigned to at least one of the plurality of servers. The management server is responsive to an area assignment instruction of storage areas exceeding unassigned areas received from one of the plurality of servers to release at least part of the assignment areas of other servers as unassigned areas and assign the areas to one of the plurality of servers.

Independent claim 7 recites a storage apparatus system comprising a storage apparatuses; and a management server connected to a plurality of servers and the storage apparatuses. The management server manages storage areas of the storage apparatuses as virtual storage areas. The storage apparatuses are shared by the plurality of servers. The storage apparatuses include assignment areas which are storage areas assigned to at least one of the plurality of servers. The management serve is responsive to an area assignment instruction of storage areas exceeding unassigned areas received from one of the plurality of servers to release at least one of assignment areas of other servers as unassigned area and assign the areas to one of the plurality of servers.

Independent claim 13 recites a computer program product for a management server which manages storage areas included in storage apparatuses as virtual storage areas. The management server is connected to a plurality of servers. The storage apparatuses are shared by the plurality of servers through the management server and include assignment areas which are storage areas assigned to at least one of the plurality of servers. The computer program product comprises code for being responsive to an area assignment instruction of storage areas exceeding unassigned areas received from one of the plurality of servers to release at least part of assignment areas of other servers as unassigned areas and assign the area to one of the plurality of servers; and a computer readable storage medium for storing the code.

One of the benefits that may be derived is that even when the unassigned area is insufficient, the storage area can be assigned to the server issuing the assignment request without waiting until the storage capacity is increased by increase of a new storage apparatus in the SAN or the like. Further, even when the assignment request of the storage areas

exceeding the unassigned areas is issued by the server, the storage areas can be assigned to the server to thereby utilize the storage area in the storage pool efficiently.

B.   Discussion of the References

It is submitted that the cited references, whether taken individually or in combination with each other, fail to teach the invention as claimed. In particular, the cited references, at a minimum, fail to teach in combination with the other limitations recited in the claims: a feature of the present invention as recited in independent claims 1 and 7, and similarly stated in independent claim 13, wherein a management server is responsive to an area assignment instruction of storage areas exceeding unassigned areas received from one of the plurality of servers to release at least part of the assignment areas of other servers as unassigned areas and assign the areas to one of the plurality of servers (claim 13 recites code for being responsive to the area assignment instruction).

1.   U.S. Patent No. 6,606,690 B2

This reference discloses a system and method for accessing a storage area network as network attached storage. Discussed are SAN servers 302 that communicate with NAS servers 304 using a protocol containing commands that the NAS servers 304 understand. The commands can direct the NAS servers 304 to allocate and deallocate shared storage 110, 112, 114 from the SAN 120 to and from the second network 116. SAN storage manager 404 located in SAN server 302 communicates with NAS server 304 through second network interface 402 to allocate and deallocate storage from NAS server 304. SAN storage manager 404 can send allocation and deallocation directives, and status directives, to NAS server 304. See Figs. 3B and 4; column 5, lines 26-30; column 6, lines 59-62; and column 17, lines 53-57.

The reference is directed to commands that direct the NAS servers to allocate and deallocate shared storage between the SAN and the second network. It does not, however, disclose a management server that responds even to an area assignment instruction of storage areas exceeding unassigned areas and assigns storage areas to the servers. More particularly, the reference fails to teach the above-described feature of the present invention as recited in independent claims 1 and 7, and similarly stated in independent claim 13.

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2.   U.S. Patent Publication No. 2002/0078174 A1

This reference discloses a method and an apparatus for automatically adapting a node in a network. Discussed is a storage management subsystem 2070 that monitors cluster storage usage, supports content rating and pruning, and notifies the content management servers (CMS) 570 of the storage usage of each content provider. Pruning includes freeing the storage used by some blocks or files for use by other blocks or files based on specific usage patterns. The storage management subsystem 2070 includes a storage management agent that monitors the total local storage availability and the storage availability of a content provider, schedules content pruning, and reports storage usage information and shortage warnings to CMS 570. See Figs. 5 and 20; and paragraphs [0121], [0175], and [0186]. Applicants note that there are 23 known family members for this U.S. patent application.

Although the reference discloses a storage management agent for monitoring storage availability, the storage management agent is not a management server that responds to an area assignment instruction of storage areas exceeding unassigned areas and assigns storage areas to the servers. More particularly, the reference fails to teach the above-described feature of the present invention as recited in independent claims 1 and 7, and similarly stated in independent claim 13.

3.   U.S. Patent Publication No. 2002/0156984 A1

This reference contains the same disclosure as reference #1.

4.   U.S. Patent Publication No. 2003/0110263 A1

This reference discloses managing storage resources attached to a data network. Discussed is a system for dynamically managing and allocating storage resources 141-143 to application servers 121-123 connected to a data network 100. A managing server 150 identifies all the physical storage resources 141-143 that are connected to network 100 and collects them into a virtual storage pool 160, which is implemented by a plurality of segments that are distributed, using predetermined criteria that are dynamically processed and evaluated, among the physical storage resources, such that the distribution is transparent to each application. Server 150 can re-allocate virtual storage resources to each application

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according to its actual needs and the level of usage. See Fig. 1; and paragraphs [0041] and [0042].

The reference is directed to a managing server that allocates and re-allocates virtual storage resources to each application according to its actual needs and level of usage. It does not, however, disclose a management server that assigns storage areas to the servers in response to even an area assignment instruction of storage areas exceeding unassigned areas. More particularly, the reference fails to teach the above-described feature of the present invention as recited in independent claims 1 and 7, and similarly stated in independent claim 13.

5.   U.S. Patent Publication No. 2003/0236884 A1

This reference discloses a computer system and a method for storage area allocation. Discussed is a device allocation program on a host 11 that sends a request to a storage management server 13. The storage management server 13 compares the storage configurations of the SAN and NAS systems with the presented requirements for the file system area, selects a storage area 12 which best meets the requirements, reconfigures the storage and returns the information about the position of the allocated area to the host 11. See Fig. 1 and paragraph [0100].

The reference relates to a device allocation program that selects a storage area which best meets the requirements for a file system area and reconfigures the storage accordingly. Such a device allocation scheme, however, does not assign storage areas to the servers in response to an area assignment instruction of storage areas exceeding unassigned areas. More particularly, the reference fails to teach the above-described feature of the present invention as recited in independent claims 1 and 7, and similarly stated in independent claim 13.

6.   U.S. Patent Publication No. 2004/0193827 A1

This reference discloses a computer system for managing performances of storage apparatus 40. In a computer system with a database management system (DBMS) running thereon, management of the performance of a storage apparatus is executed by using a performance indicator provided by a user job so as to simplify the management of the

performance. For this reason, a management server 120 employed in the computer system monitors an operating state of each system element, a response time onto a job and other information. Pre-given information on a process such as a performance requirement the collected monitored information 360 are used by the management server in issuing a command to change allocation of a processing amount to a port, an allocation of a cache area for data, the logical configuration of disc drives and other parameters in order to carry out the new process or in the case where a result of a judgment based on the monitored information indicates that tuning is necessary.

The reference is directed to a management server that collects monitored information and uses the information to change allocation of processing amount to a port, cache area for data, logical configuration of disk drives and other parameters. Changing allocation of processing amount, cache area, and logical configuration is different from assigning storage areas to the servers in response to an area assignment instruction of storage areas exceeding unassigned areas. More particularly, the reference fails to teach the above-described feature of the present invention as recited in independent claims 1 and 7, and similarly stated in independent claim 13.

7.   U.S. Patent Publication No. 2004/0194061 A1

This reference discloses a method for allocating programs. Disclosed is monitoring that is performed with regard to the performance and capacity of a server executing various business application programs (APs), the performance and capacity of a storage device, or a cluster made up of a plurality of servers. A business service is provided by reallocating the business AP in accordance with these monitoring results. If the load for a particular server has increased, then reallocation can be performed unnecessarily for that business AP. A space scheduler 44 of a private domain management server 11 determines surplus resources. See Fig. 36; and paragraphs [0005], [0006], and [0197].

The reference relates to reallocating business application program in accordance with results of monitoring the performance and capacity of a storage device. The reallocation of business applications is different from assigning storage areas to the servers in response to an area assignment instruction of storage areas exceeding unassigned areas. More particularly, the reference fails to teach the above-described feature of the present

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invention as recited in independent claims 1 and 7, and similarly stated in independent claim 13.

8.   Japanese Patent Publication No. JP 10-333950

This reference discloses a free file space preparation system to secure a free file space and to continue a file preparation processing and a file extension processing by releasing an unused file space in the case of lacking the free file space on an auxiliary storage device at the time of file preparation and file extension. An unused file space release means 105 receives an unused file space release request from a file space securing means 104, finds a file for which the size of logic data 109 is smaller than the size of the file space 108 while retrieving file management information 107 on the auxiliary storage device 106 and releases the unused file space 110 of the difference of the file space 108 and the logic data 109 of the file. When the unused file space 110 is released and the free file space is prepared in the auxiliary storage device 106, control is returned to the file space securing means 104.

The reference discloses releasing an unused file space of the difference of the file space and the logic data of the file. Such a release scheme, however, does not assign storage areas to the servers in response to an area assignment instruction of storage areas exceeding unassigned areas. More particularly, the reference fails to teach the above-described feature of the present invention as recited in independent claims 1 and 7, and similarly stated in independent claim 13.
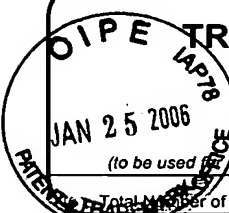
9.   Evaluator Group, Inc., "Virtualization of Disk Storage," The Evaluator Series, WP-0007-1, September 2000, at pp. ii, 1-12.

This reference discloses the virtualization technique for disk storage. According to the virtualization technique, a management server connected to storage apparatuses and servers using the storage apparatuses manages storage areas of the storage apparatuses connected to the SAN as virtual storage areas (storage pool) collectively and receives requests from the servers to the storage apparatuses. The management server accesses to the storage areas of the storage apparatuses connected thereunder in response to the requests from the servers and returns its results to the servers.

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As described in the present application at page 1, line 17 to page 2, line 18, the reference provides background details of a virtualization technique. It does not disclose a management server that responds even to an area assignment instruction of storage areas exceeding unassigned areas and assigns storage areas to the servers. More particularly, the reference fails to teach the above-described feature of the present invention as recited in independent claims 1 and 7, and similarly stated in independent claim 13.

(f)   In view of this petition, the Examiner is respectfully requested to issue a first Office Action at an early date.
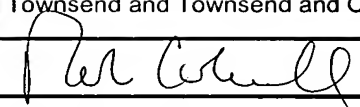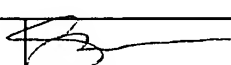
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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Townsend and Townsend and Crew LLP
Signature	*[signature]*
Printed name	Robert C. Colwell
Date	1/23/06	Reg. No.	27,431

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